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EXAMINER	
TSAI, SHENG JEN	

ART UNIT	PAPER NUMBER
2186	

DATE MAILED: 03/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/923,727	LOMNES, RANDY KEITH	
	Examiner	Art Unit	
	Sheng-Jen Tsai	2186	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 August 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-83* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-83* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *04/16/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-83 are presented for examination in this application (09,923,727) filed on August 6, 2001.

Acknowledgement is made to the Information Disclosure Statement received on April 16, 2004.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-24, 32-47, 54-55, 58-67, 69-70, 72, 74-79, and 81-83 are rejected under 35 U.S.C. 102(e) as being anticipated by Schneider et al. (U.S. 6,016,553).

As to claim 1, Schneider et al. disclose **a method in a computer system for securing data stored on a storage device** [Method, Software and Apparatus for Saving, Using and Recovering Data (title); figures 55, 56, 57, and 58 shows the computer system including various types of storage device (floppy disk, CD ROM, memory)], **the computer system having a redirection driver** [the corresponding

redirection drive is an engine shown in figures 26, 27A, 27B, and 27C; the engine is a functional block between the operating system and the physical disk drive and provides the mapping (i.e., redirection) from the desired locations (i.e., the protected area) to the extra available area as shown in these figures; note that the concept of a Driver and an Engine are essentially the same (column 65, lines 21-22)], **available storage** [figure 24 shows extra pages for new state and unused extra pages, both represent available storage], **and redirected storage** [figure 24 shows extra pages for new state and unused extra pages, both may be used as redirected storage; also refer to figures 18 and 19], **comprising**:

receiving a request to access a portion of data on the storage device, the request referring to an original location on the storage device [the corresponding original location is referred to as the "main area" by Schneider et al. ; a scenario describing a write access to the main area by diverting the new data into extra pages (the effective write location EW) is given in column 15, lines 30-65] ;

under control of the redirection driver [the following are the eight steps performed by the engine (i.e., the redirection driver) when the OS (Operating System) writes new data to a specific disk location (column 15, lines 31-33)],

intercepting the request to access the data [figures 26, 27A, 27B, and 27C];

determining whether the request refers to an original location that has previously been redirected to redirected storage [figures 10, 11, 12, and 13A~13V illustrate the use of a "history swap" and a "map" to store and provide the information if

an original storage location (i.e. main area) has previous been redirected to redirected storage (i.e., the extra pages)];

when the request refers to an original location that has previously been redirected to redirected storage, using a location in redirected storage as a current redirected location, otherwise allocating available storage to a new location in redirected storage and using the new location as the current redirected location [figures 13A~13V; column 15, lines 63-67; column 16, lines 1-44]; **and**

redirecting the access request to refer to the current redirected location, such that the request transparently accesses the current redirected location instead of the original location [figures 13A~13V; the circular history buffer may also be implemented by saving new data elements into new locations and leaving the old data elements in their original locations. References to the new data elements are mapped to the new locations (abstract)]; **and**

restarting the computer system from a powered-down state, wherein the data stored in the original location on the storage device remains unaltered, without any restorative copying of data [a method and apparatus for reverting a disk drive to an earlier point in time is disclosed; reads to the disk are mapped to the old data elements still stored in their original locations (abstract); In FIG. 13A, the initial state of the engine is shown. There is nothing in the extra pages (i.e., no restorative copying of data) (column 16, lines 45-50)].

Further, claims 32, 54, 55, 72, 79, and 83 are rejected due to the same reasoning as provided in "As to claim 1."

As to claim 2, Schneider et al. disclose **a computer system for securing data stored on a storage device** [refer to "As to claim 1"], **comprising**:

data access request that refers to an original location on the storage device [refer to "As to claim 1"];

available storage [refer to "As to claim 1"]; **and**

redirection driver [refer to "As to claim 1"]**, installed in the computer system during power-up initialization** [It is important that the "ROM" containing the Driver is a non-volatile memory so that it is always intact upon starting the computer (column 65, lines 34-36)]:**, that,**

automatically intercepts the data access request [refer to "As to claim 1"]; **and redirects the access request to access a redirected location in the available storage, such that a requested modification at the original location is not performed and is instead performed to the redirected location, and such that, when the computer system is restored from a powered-down state, the data in the original location on the storage device remains unaltered without any restorative copying** [refer to "As to claim 1"].

As to claim 3, Schneider et al. disclose **a method in a computer system for protecting data stored in a portion of a storage device** [refer to "As to claim 1"] **having a designated protected space** [the "main area" is the corresponding

designated protected space, see figures 1 and 24], **the computer system having a redirected space** [refer to "As to claim 1"], **comprising**:

intercepting a request from requesting code to access a location in the protected space of the storage device [refer to "As to claim 1"]; **and**

determining a location in the redirected space that is associated with the location in the protected space [refer to "As to claim 1"]; **and**

redirecting the intercepted request to access the determined location in the redirected space instead of the location in the protected space, in a manner that is transparent to the requesting code, so that the data stored in the location in the protected space remains unaltered [refer to "As to claim 1"].

As to claim 4, refer to "as to claim 3" and "As to claim 1."

As to claim 5, Schneider et al. disclose that the driver is inserted into a driver hierarchy that is controlled by an operating system of the computer system [figures 26, 27A~27C shows that the driver/engine is controlled by the operating system; column 66, lines 22-60].

As to claims 6 and 8, Schneider et al. teach the use of an external disk, in additional to the original, internal disk so that the entire internal disk can be designated as the protected area and the external disk serves as the extra storage as well as the redirected area (figures 41A~41I; column 49, lines 55-67; column 52, lines 29-67).

Further, claims 33, 35, and 58 are rejected due to the same reasoning as provided in "As to claims 6 and 8."

As to claim 7, figures 2 and 27A~27C show the case where the redirected space (i.e., the extra area) resides in the same storage device where the main area also resides.

Further, claims 34 and 59 are rejected due to the same reasoning as provided in "As to claim 7."

As to claim 9, Schneider et al. teach that reads to the disk are mapped to the old data elements stilled stored in their original locations. Thus one of the access operation is to read from the protected area.

Further, claims 36, 60, and 81 are rejected due to the same reasoning as provided in "As to claim 9."

As to claim 10, refer to "As to claim 1."

As to claim 11, refer to the example of writing to the protected area (i.e., the main area) in cloumn15, lines 63-67; column 16.

Further, claims 37, 61, and 82 are rejected due to the same reasoning as provided in "As to claim 11."

As to claims 12 and 38, refer to "As to claim 1."

As to claim 13, refer to "As to claim 1."

As to claims 14 and 39, refer to "As to claim 1."

As to claims 15, 40, and 62, figures 56, 57, and 58 shows the use of floppy disk, CD ROM and memory (semi-persistent storage device); Schneider et al. teach that their method and apparatus apply to all types of computer system the utilize one or more hard disks (column 4, lines 47-50).

As to claims 16-17, 20, 41-42 and 63, Schneider et al. teach that placing a Driver (i.e., the Engine), which maintains and protects historic disk sector states, in a disk controller creates a firewall (column 67, lines 1-8). Thus, the protected space and the redirected space can be a sector or a group of sectors. Further, figure 28 shows that both the protected space and the redirected space can be a block (i.e., a cluster) or group of blocks.

As to claims 18 and 43, Schneider et al. teach that more than one disk may be involved, with their collective storage pooled into one large logical disk (column 49, lines 58-60). Thus the concept of a logical sector is utilized in their scheme.

As to claim 19, Schneider et al. teach that these "areas" as a result of the engine's mapping, are typically intermixed and spread across the physical disk (column 28, lines 55-56).

As to claims 21, and 44, Schneider et al. teach that the Driver records all or portion of altered files (instead of disk sectors); that the protocol of a file level Driver would be similar to that of a network file server (column 67, lines 4-8). A network file server represents an abstraction of storage that is larger than a sector.

As to claims 22 and 45, figure 41G show a combination of different storage units that can be used as redirected space.

As to claims 23 and 46, refer to "As to claim 19" and "As to claim 20." Note that the concept of a "logical" space leads to a "virtual" space.

As to claims 24, 47, and 67, the extra pages (figures 1 and 24) that are used as redirected space essentially serves as "unprotected space," as their contents are to be

overwritten by the new data elements being redirected from the protected area. As such, the access to these extra pages is directly associated to these pages without redirection.

As to claims 64, 75 and 77, refer to "As to claim 21." The concept of file and file server represent a multiple different data abstraction.

As to claims 65 and 76, refer to "As to claim 16," "As to claim 19," "As to claim 23," and "As to claim 21" for virtual/logical sector/block/cluster data space.

As to claim 66, Schneider et al. teach that it is important that the "ROM" containing the Driver is a non-volatile memory so that it is always intact upon starting the computer (column 65, lines 34-36).

As to claim 69, figures 26 and 27A~27C show that all the access, including to both the protected and unprotected space, are redirected by the engine.

As to claim 70, figures 8 and 24 show the use of map (table) to track the unprotected space (extra pages).

As to claim 74, figure 41G shows that the device drive comprising one of a plurality of device drivers (there are 4 of them in figure 41G) that are arranged in a layer fashion, and the redirection driver is installed between two of these device drivers.

As to claim 78, figure 12 shows the data structure (map, link), which jointly serve as the corresponding redirected table to maintain the association.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claim 73 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schneider et al. (U.S. 6,016,553).

As to claim 73, Schneider et al. do not mention that the redirection driver cannot be uninstalled by a user without special access privileges. However, it is well known that such a responsibility and privilege is only granted to special user such as a system administrator (see Microsoft Computer Dictionary, 5th edition, Microsoft Press, 2002, page 508). Such a policy is needed to maintain the security and availability of the system resources. Therefore, it would have been obvious for one of ordinary skills in the art at the time of Applicant's invention to realize the importance of granting the installing/uninstalling privilege only to authorized persons, and to enforce this policy on the system disclosed by Schneider et al. to ensure the security of the system.

6. Claims 25-31, 48-53, 56-57, 68, 71, and 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schneider et al. (U.S. 6,016,553), and further in view of White et al. (U.S. 6,092,161).

As to claims 25-26 and 48-49, Schneider et al. do not explicitly teach **receiving a request to shutdown the computer system and the subsequent action of disregarding the data in the redirected area**. However, White et al. teach in their invention "Method and Apparatus for Controlling Access to and Corruption of Information in a Computer" that a system reset (i.e., including the power shutdown) causes the updated information, together with the list of pointers to this information to be cleared, and returns the WMR partition to its original state (column 2, lines 23-26; column 3, lines 19-23; column 6, lines 50-55). The disregarding of the updated data in the redirected area saves disk space and is easy to implement. Therefore, it would have been obvious for one of ordinary skills in the art at the time of Applicant's invention to realize the benefit of disregarding of the updated data upon reset/shutdown, and to incorporate it into the existing scheme disclosed by Schneider et al. to enhance the system.

As to claims 27-28, 50-51, 57 and 71, Schneider et al. do not explicitly teach **receiving a request to shutdown the computer system and the subsequent action of saving the data in the redirected area**. However, White et al. teach in their invention "Method and Apparatus for Controlling Access to and Corruption of Information in a Computer" that if, upon a system reset, a write command is issued to overwrite any information stored in a/the WMR partition the updated information stored elsewhere is copied back to the WMR partition (column 3, lines 55-60; column 4, lines 43-50). The saving of the updated data in the redirected area provides another option for users to update their database if so desired. Therefore, it would have been obvious

for one of ordinary skills in the art at the time of Applicant's invention to realize the benefit of saving of the updated data upon reset/shutdown, and to incorporate it into the existing scheme disclosed by Schneider et al. to further enhance the flexibility of the system.

As to claims 30, 31, 53 and 56 Schneider et al. do not explicitly teach **using redirection tables to associate locations in the protected space to locations in the redirected space**, although they do teach the use of mapping tables to achieve the same purpose. Further, White et al. teach in their invention "Method and Apparatus for Controlling Access to and Corruption of Information in a Computer" explicitly the use of File Allocation Table to be associated with each WMR partition (column 4, lines 25-30), and a Sector Relocation Table (column 2, lines 66-67). The use of the tables make it easy to understand the relationship between a protected and a redirected space, and also make it easy to maintain the software/program. Therefore, it would have been obvious for one of ordinary skills in the art at the time of Applicant's invention to realize the benefit of utilizing the various tables, and to incorporate it into the existing scheme disclosed by Schneider et al. to further enhance the flexibility of the system.

As to claims 68 and 80, Schneider et al. do not explicitly teach that **the redirection driver disregarding requests to access locations referred to by the unprotected space so that data in the unprotected locations is modified according to the access requests**. However, White et al. teach in their invention "Method and Apparatus for Controlling Access to and Corruption of Information in a

Computer" that reading and writing may be allowed for user-granted information sectors (i.e., unprotected space) in an active general partition (column 5, lines 3-10). Allowing users to access unprotected space makes the system more user-friendly and also better utilizes the computer resources. Therefore, it would have been obvious for one of ordinary skills in the art at the time of Applicant's invention to realize the benefit of allowing the access to unprotected space, and to incorporate it into the existing scheme disclosed by Schneider et al. to further enhance the flexibility of the system.

As to claims 29 and 52, refer to "As to claim 26" and "As to claim 28." White et al. teach that the use of a list of pointer to link the updated information locations to the corresponding protected locations. White et al. further teach that the updated information stored elsewhere is copied back to the WMR partition upon a reset. White el al. do not teach saving the association (i.e., the linking pointers) between them instead of copy the data from one to the other. However, it is a well-known and common practice in a software environment to use pointers to reference to certain set of data without copying it, known as reference type (refer to Microsoft Computer Dictionary, 5th edition, Microsoft Press, 2002, page 444, reference type). The use of reference type may save operational time of the software because it avoids the step of copying data from one location to another. Therefore, it would have been obvious for one of ordinary skills in the art at the time of Applicant's invention to realize the benefit of using the pointers to facilitate reference type instead of copying data, and to incorporate it into the existing scheme disclosed by Schneider et al. to further enhance the flexibility of the system.

7. ***Related Prior Art***

The following list of prior art is considered to be pertinent to applicant's invention, but not relied upon for claim analysis conducted above.

- Piazza, (U.S. 5,603,011), "Selective Shadowing and Paging in Computer Memory Systems."
- Wade et al., (U.S. 5,552,776), "Enhanced Security System for Computing Devices."
- Alexander et al., (U.S. 5,363,334), "Write Protection Security for Memory Device."
- Brant et al., (U.S. 5,848,435), "Address Protection Circuit and Method for Preventing Access to Unauthorized Address Ranges."
- Rose, (U.S. 5,144,660), "Securing a Computer against Undesired Write Operations to or Read Operations from a Mass Storage Device."
- Berglund et al., (U.S. 3,828,327), "Simplified Storage Protection and Address Translation under System Mode Control in a Data Processing System."
- Elliott et al., (U.S. 5,559,993), "Hardware Circuit for Securing a Computer against Undesired Write and/or Read operations."
- Schlotterer et al., (U.S. 3,827,029), "Memory and Program Protection System for a Digital Computer System."
- Belsan et al., (U.S. 5,193,184), "Deleted Data File Space Release System for a Dynamically Mapped Virtual Data Storage Sussystem."

Conclusion

8. Claims 1-83 are rejected as explained above.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sheng-Jen Tsai whose telephone number is 571-272-4244. The examiner can normally be reached on 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Kim can be reached on 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sheng-Jen Tsai

Examiner

Art Unit 2186

March 4, 2005

PIERRE BATAILLE
PRIMARY EXAMINER